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Propagation: Starting Seedlings at Home

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Starting transplants from seeds in your home is a good way to get a head start on the growing season. By setting vigorous transplants into the garden instead of planting seeds, at least 4 to 8 weeks can be cut from the period between planting and harvesting or from the time it takes to get effective color into the landscape.

Growing your own plants may be the only way to obtain a new or special variety you want. Commercial plant growers cannot be expected to grow all of the hundreds of varieties offered by seedhouses, and plant nurseries are often reluctant to offer varieties that have not been given widespread publicity.

Growing Media

Use of a loose, fertile, disease-free soil mix is a basic key to success. To prepare a mix of this type, combine by volume one part sandy loam with one part sand or vermiculite, plus one part Michigan or Canadian sphagnum peat. Anyone having clay loam should use one part soil to two parts sand or vermiculite and one part peat.

The mix must be pasteurized to kill harmful fungi,bacteria, weed seeds and nematodes that it may contain. Pasteurization can be easily accomplished by placing the soil mix in a shallow metal pan, covering the pan tightly with aluminum foil and heating the soil to 160° in an oven. Keep the soil at this temperature for at least 1 hour or until a potato imbedded in the soil is baked. After cooling, the soil is ready for planting.

Alternatively, premixed, soilless material can be bought in nurseries and stores. Commercial soilless mixes are more expensive than the soil mix described above, but they can be used directly from the bag without pasteurization. These mixes are economical when used in moderation. The following recipe for a soilless mix can be prepared at home if the ingredients can be obtained from a local nursery or through a catalog. This "peatlite" mix is excellent for starting seeds and growing seedlings to transplant size.

- 1/2 bushel horticultural perlite, vermiculite, calcined clay, or humus
- 1/2 bushel coarse sphagnum peat moss or shredded pine bark
- 3 ounces 20% superphosphate
- 6 ounces dolomitic limestone or ground limestone
- 3 ounces complete fertilizer, such as 8-8-8 or 12-12-12

Peat mixes with the other ingredients more easily if it is moist—but not soaking wet. The night before preparing the mix, spread out the dry peat and sprinkle with just enough water to dampen it, or dampen it in the bag. Then follow these steps in mixing the ingredients:

1. Pour the dampened peat moss or shredded pine bark and perlite or vermiculite into a rough pile. Sprinkle the fertilizer over the top.
2. Shoveling from the base of the pile, make a second cone-shaped pile by pouring each shovelful directly on top so ingredients dribble down the sides.
3. Shovel from the second pile and repeat the cone-shaped pile as before.
4. Repeat the process again. It should now be well mixed. Store the mix in clean plastic bags or plastic cans to keep it moist and clean.

Containers

Any shallow wood, metal or plastic container at least 3 inches deep makes a suitable plant growing box. Milk cartons, foam cups, peat pots, and egg cartons make nice individual plant containers. Punch holes in the bottom of any carton, cup or pan to allow water to drain from the soil.

Sow seeds in rows 2 inches apart in a box of soil. If seedlings touch, remove some and transplant to give them more room to grow. If enough growing space is available, plant seeds directly into individual pots thereby eliminating the initial transplanting.

Regardless of the starting method, gardeners should allow proper space for each plant to develop. Crowded seedlings become stretched and unhealthy.

Seedings

Consult Table 1 for the optimum seeding date. Peppers require 7 to 8 weeks and tomatoes 5 or 6 to grow to transplanting size. Squash and cucumbers require only 2 to 3 weeks to grow to an ideal size. Members of the cabbage and lettuce families need 4 to 5 weeks. Flowering annuals also vary in the time required to produce a size suitable for transplanting. Much depends on local growing conditions. It is important to keep a garden notebook and record seeding dates, length of time to germinate and time required to reach transplant size. Seedlings are ready to transplant when they have the first set of true leaves.

Table 1. Planting and growing information for vegetables.

Kind of vegetable	Weeks needed to grow transplants*	Seed planting depth	Optimum temperature for germination	Plant-growing temperatures	
				Day	Night
	(weeks)	(inches)	(°F)	(°F)	(°F)
Cabbage, broccoli and cauliflower	5 to 7	1/4 to 1/2	85	60–70	50–60
Lettuce	4 to 6	1/4 to 1/2	75	60–70	50–60
Onions	8 to 10	1/2	75	60–70	45–55
*Depends on type of plant-growing structures used, heating facilities, and lighting available.					

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	(weeks)	(inches)	(°F)	(°F)	(°F)
Tomatoes	5 to 6	1/4 to 1/2	85	70–80	60–65
Peppers	7 to 8	1/4 to 1/2	85	70–80	60–70
Eggplant	7 to 8	1/4 to 1/2	85	70–80	65–70
Cucumber, squash, muskmelon and watermelon	2 to 3	3/4 to 1	85	70–90	60–70
*Depends on type of plant-growing structures used, heating facilities, and lighting available.					

Temperature is important. Cool soil retards germination. Warm the soil to about 75° if possible until seedlings have emerged above the soil surface. Provide an air temperature of 70° to 75° during the day and night temperature of at least 60° to 65°.

Cover the seed only enough to make it disappear from view (rule of thumb: twice as deep as the diameter of the seed). The seed packet usually gives correct planting depth. After seeding, water the soil gently but thoroughly until water drains out the bottom of the container, being careful not to wash seeds away. Place containers in plastic bags or cover the soil surface with plastic film until the first sign of seeding emergence. Then remove the plastic cover immediately and be sure the container gets maximum exposure to light. Most seeds do not require light to germinate, but seedlings need full exposure to light as soon as they emerge.

Transplanting

Begin transplanting when the first true leaves are forming, usually 2 to 3 weeks after sowing. Set the seedling at the same level it was in the seedling flat. When firming the soil avoid injuring tender stems.

Immediately after transplanting, water each seedling container thoroughly. Wilting at this point can damage young plants severely. To prevent excessive wilting, shade plants from strong sunlight for 2 or 3 days after transplanting.

Spacing

Frequently, plant quality suffers from crowding too many plants into a small area. Crowded seedlings become weak and spindly and are more susceptible to disease. Wider spacing or larger containers permit stronger growth. As a rule of thumb, to produce high quality plants, space them so that the leaves of one plant do not touch those of another.

Watering

Add water to soilless media only when moisture can no longer be squeezed out by pinching the medium between the thumb and forefinger. Water soil only when it no longer feels moist when rubbed between the fingers. Apply enough water at each irrigation so that some drips out of the drain holes in the bottom of the container. Be sure the water is passing through the rootzone-not just down the inside wall of the container.

Fertilizing

After seedling emergence and during early development, strong, rapid plant growth can be assured by watering the soil with a carefully prepared solution of a soluble fertilizer which is specifically designed for plant production. Prepare the solution exactly as prescribed on the label. Apply the solution as an irrigation when water is needed. Apply the solution as an irrigation when water is needed. Apply enough to allow some to flow out the drain.

Table 2. An aid in diagnosing plant-growing disorders and problems

Symptoms	Possible causes	Corrective measures
Spindly growth or leggy plants	1. Shade causes excessive elongation	Full sunlight whenever possible
	2. Prolonged cloudy weather during growing season	Maintain lower temperatures during cloudy weather. See Table 1
	3. Excessive watering	Water when necessary to maintain a moist but never wet soil condition
	4. Temperatures too high	Skillful management of temperatures. See Table 1
	5. Excessive fertilizer	Apply fertilizer less frequently and/ or reduce the concentration
	6. Poor plant spacing	At all times provide young plants with adequate space for stocky development
Dwarf plants	Low fertility. Severe cases will be accompanied by nutrient deficiency symptoms. See A1 and A2 below	Nutrient levels difficult to maintain because of small volume of soil. Apply fertilizers often and in low concentrations.
A. Leaves discolored	1. Phosphorus deficiency. plants dwarf early in growth; stems are slender, fibrous and hard. Underside of leaves and stems becomes reddish-purple. Leaves are small and roots stunted. Soil may be too acid.	Apply a high-phosphorus plant-starter solution, such as a 10-55-10, 10-52-17 or 15-30-15 analysis. Use 2 tablespoons to 1 gallon of water.
	2. Nitrogen deficiency. General indication of nitrogen deficiency is lack of green in the retarded growth with stems and leaves. If the soil is very deficient in nitrogen, symptoms may appear early in the seedling stage. If there is adequate nitrogen to support early growth only, deficiency symptoms may appear later.	Apply nitrogen in water. Dissolve 2 teaspoons of ammonium nitrate or 3 teaspoons of ammonium sulfate per gallon of water. Be sure to wash solution from foliage with plain water after fertilizing.
B. With root discoloration	1. Excess soluble salts from overfertilizing. Plants wilt in bright sunshine. Lower leaves turn yellow and drop off, and plant finally dies or has very small root system which is often discolored.	Leach excess salts. Not generally a problem where regular feeding schedule is maintained. Maintain a moist soil condition.
C. Without root discoloration	Low temperature. Retarded growth.	Maintain proper day and night temperatures. Do not start plants too early.

Symptoms	Possible causes	Corrective measures
Tough, woody plants	Plants likely to be over-hardened	Apply plant starter solution 3 to 4 days before setting out. Use analysis such as 10-55-10 or 10-52-17 at the rate of 2 tablespoons (1 ounce) to a gallon of water.
Decay or rotting of the stems of young plants near the soil surface.	Damping-off. Disease organisms attack germinating seeds and young plants, especially during prolonged cloudy weather.	Use of sterilized soil-mix, skill in watering and ventilating and proper regulation of temperature.
Retarded root growth	1. Poor soil mixture	All factors influencing root growth are especially important. Root growth and formation of new roots are dependent on the food supply from the plant top, good aeration, ample supply of nutrients, adequate moisture and temperature.
	2. Poor soil aeration	
	3. Poor drainage	
	4. Lack of fertility	
	5. Excess soluble salts	
	6. Low temperature	
Green algae and mosses growing on soil	Such growth usually occurs on soils with a high moisture content. It is more evident in shade and when prolonged cloudy weather exists during the plant-growing season. Under these conditions, moisture is retained near the soil surface, making conditions favorable for its growth. Poor soil structure, poor aeration.	Increase air movement around plants and practice morning watering. Add coarse, aggregate material to loosen the media, to decrease its water-holding capacity and to increase its air space.

Table 3. Planting and Growing Information for Flowering Annuals

	A	B	C	D
Ageratum	70°F	L	5 days	6–8
Alyssum	70°F	DL	5 days	3–5
Calendula (pot marigold)	70°F	D	10 days	7–8
Carnation (annual)	70°F	DL	20 days	11–12
Celosia	70°F	DL	10 days	8–9
Coleus	65°F	L	10 days	7–10
Cosmos	70°F	DL	5 days	6–8
Dahlia (from seed)	70°F	DL	5 days	6–8
Dianthus (annual pinks)	70°F	DL	5 days	6–7
Dusty Millers				
Centaurea gymnocarpa	65°F	D	10 days	7–8
Others	75°F	L	10 days	6–7

Key: Column A = Optimum soil temperature for best germination
Column B = (D) Seeds germinate best in darkness
(L) Seeds germinate best in light
(DL) No light requirements
Column C = Usual number of days required for uniform germination at optimum temperature
Column D = Number of weeks needed to grow transplants

	A	B	C	D
Gaillardia (annual)	70°F	DL	20 days	7–9
Impatiens (sultana)	70°F	L	15 days	4–6
Lobelia	70°F	DL	20 days	5–6
Marigold (dwarf types)	70°F	DL	5 days	6–7
Marigold (tall types)	70°F	DL	5 days	3–4
Pansy	65°F	D	10 days	10–12
Petunia	70°F	L	10 days	5–7
Phlox drummondi (annual phlox)	65°F	D	10 days	5–6
Portulaca (rose moss)	70°F	D	20 days	4–6
Rudbeckia (coneflower)	70°F	DL	10 days	6–7
Salvia splendens	70°F	L	15 days	5–6
Snapdragon	65°F	L	10 days	5–7
Verbena	65°F	D	20 days	5–7
Vinca rosea (periwinkle)	70°F	D	15 days	7–8
Zinnia	70°F	DL	5 days	3–5

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HARRIS COUNTY Master Gardener ASSOCIATION

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